

Badger Minerals LLC

414 10th Avenue
Menominee, MI 49858
906-352-4024

April 28, 2020

Melissa Yarrington
State of Wisconsin
Department of Natural Resources
Melissa.yarrington@wi.gov

RE: Badger Minerals Schoepke Project – Notice of Intent to Drill – Disturbance Estimate for Stormwater – Erosion Control

Dear Ms. Yarrington,

The following information is provided in response to the Departments comments to Badger Minerals' Notice of Intent to Drill document which were received by Badger Minerals on February 7, 2020. Included within the document, with respect to the section "Stormwater – Erosion Control", you had requested additional information outlining the planned disturbances related to the exploration drilling at the project and had advised that if the "total land disturbance was equal to or greater than one acre, a construction site permit is required under NR 216, Wis. Adm. Code".

Badger Minerals estimates that the total potential land disturbance related to the proposed drilling project is **34,500 square feet** or **0.79 acres**. While actual disturbance may deviate (+/-) from this estimate based on ground conditions at each site, Badger Minerals is confident that the additional allowable disturbance of 9,060 square feet (0.21 acres) is more than sufficient to complete the project without the requirement of a construction site permit under NR 216, Wis. Adm. Code.

Estimates for total disturbance for this project take into consideration the following items (discussed in more detail below):

1. A reduction in the total number of drill sites from the originally planned 10 drill sites to 8
2. A revised estimate of the drill site footprint which includes accommodation of soil stockpiles and updated drilling equipment sizing

3. An estimation of potential disturbance related to clearing a path to the drill site off of established forest trails.
4. Considerations related to potential disturbances at loading/off-loading/staging sites as well as water withdrawal sites

Badger Minerals will implement the use of BMPs throughout the drill program to prevent/reduce the potential for erosion of disturbed materials and sedimentation into waters of the state as required under the performance standards outlined within NR 151.105. Final drill site locations will be adjusted, to the greatest extent practical, to minimize total disturbance and the location of the sump and soil stockpiles will be placed in locations away from slopes and natural drainage ways. BMPs will include the use of silt socks/silt fences to reduce the migration of sediment from disturbed soils as well as seeding/mulching to stabilize disturbed areas after they have been regraded. Such mitigation measures will be planned on a 'case by case', 'site by site' basis and will take into account the location of disturbed soils (sumps, soil stockpiles, excessive rutting, etc.) and the topography present as well as the proximity to nearby water features.

Please don't hesitate to contact me if you have any questions, would like to discuss further, or require additional information.

Sincerely,

Eric Quigley

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Badger Minerals – Schoepke Project – Soil Disturbance Estimate – Additional Details

1. Badger Minerals has revised their proposed drill plan to exclude the drill sites RB-02 and LB-02 (see originally submitted NOI document) decreasing the total number of proposed drill site to 8 (10 previously). The total number of drill holes and estimated footage has not changed and it is planned that the holes originally planned to be completed at the excluded sites can be drilled from the adjacent drill sites (RB-01 and LB-01). See **Figure 1** below for revised drill site locations.
2. Badger Minerals has revised the estimate of the footprint of a typical drill site which was previously estimated at 50'x50' and has subsequently increased the planned footprint to 50'x62.5'. The revision incorporated an estimate of soil stockpile footprint (utilizing a 15% swelling factor and slopes of 35 degrees), reduced sump dimensions (based on contractor input), and more detailed equipment sizing (also based on contractor input). The plan also includes 10' wide access to the sump and rear/front of the drill rig. See **Figure 2** below. Total disturbance estimated from all drill sites is contained in **Table 1** below.
3. **Figure 1** below shows the locations of the proposed drill sites relative to the location of existing forest roads/trails. While some of the proposed drill sites are located immediately adjacent to these roads (LB-3, DB-2), other sites will require a path to be cleared for access. Disturbance calculations incorporated the length of the access from existing roads and assumed a 10' width of the path. Calculations are tabulated in **Table 1** above. Total surface area of all access paths is estimated to be 9,500 square feet.
4. There are no planned disturbances related to off-loading, loading, and staging of equipment as all activities and staging of equipment will take place on existing roads and parking areas/clearings. Any soil disturbance and rutting taking place during these activities will be graded immediately following the activity and BMPs will be implemented, if necessary, as outlined under NR 151.105.

Access to water withdrawal locations (**Figure 1**) will take place along the side/shoulder of existing roads and are not anticipated to cause disturbances. As a precaution, silt sock or silt fence will be placed in-between the shoulder of the road and the water source to prevent unanticipated sedimentation to the water body.

5. Badger Minerals will implement BMPs as required under NR 151.105 throughout the duration of the program on a 'case by case', 'site by site' basis at drill sites and along access paths as needed. BMP implementation will be based on the location of the disturbance areas (sumps, soil stockpiles, excessive rutting, etc.), topography, and the location of any water features and natural drainage ways in proximity to the disturbance. BMPs will include the use of silt socks/silt fences to reduce the migration of sediment from disturbed soils off site as well as seeding/mulching to stabilize disturbed areas after the areas have been regraded. Upon completion of regrading, seeding, and mulching, silt-socks/silt fences will be removed. In the event that significant slopes are encountered, silt socks/silt fences will be left in place until the slope is sufficiently stabilized.

6. Table 1. Disturbance Estimates for Planned Drill Sites and Access from Existing Roads/Trails

Badger Minerals - Schoepke Project - Land Disturbance Estimate				
Disturbance Area	Quantity	Dimensions		Total Area (sq. ft.)
		Length (ft.)	Width (ft.)	
Drill Sites	8	62.5	50	25,000
Access to RB-1,2		240	10	2,400
Access to RB-3		220	10	2,200
Access to DB-1		50	10	500
Access to DB-2		0	10	0
Access to DB-3		175	10	1,750
Access to LB-1,2		75	10	750
Access to LB-3		0	10	0
Access to LB-4		190	10	1,900
Loading/offloading/staging	Located on existing roadways			0
Water withdrawal locations	Located on existing roadways			0
Total (sq. ft.)				34,500
Total (acres)				0.79

Figure 1. Revised Plan Map for Schoepke Drilling Project

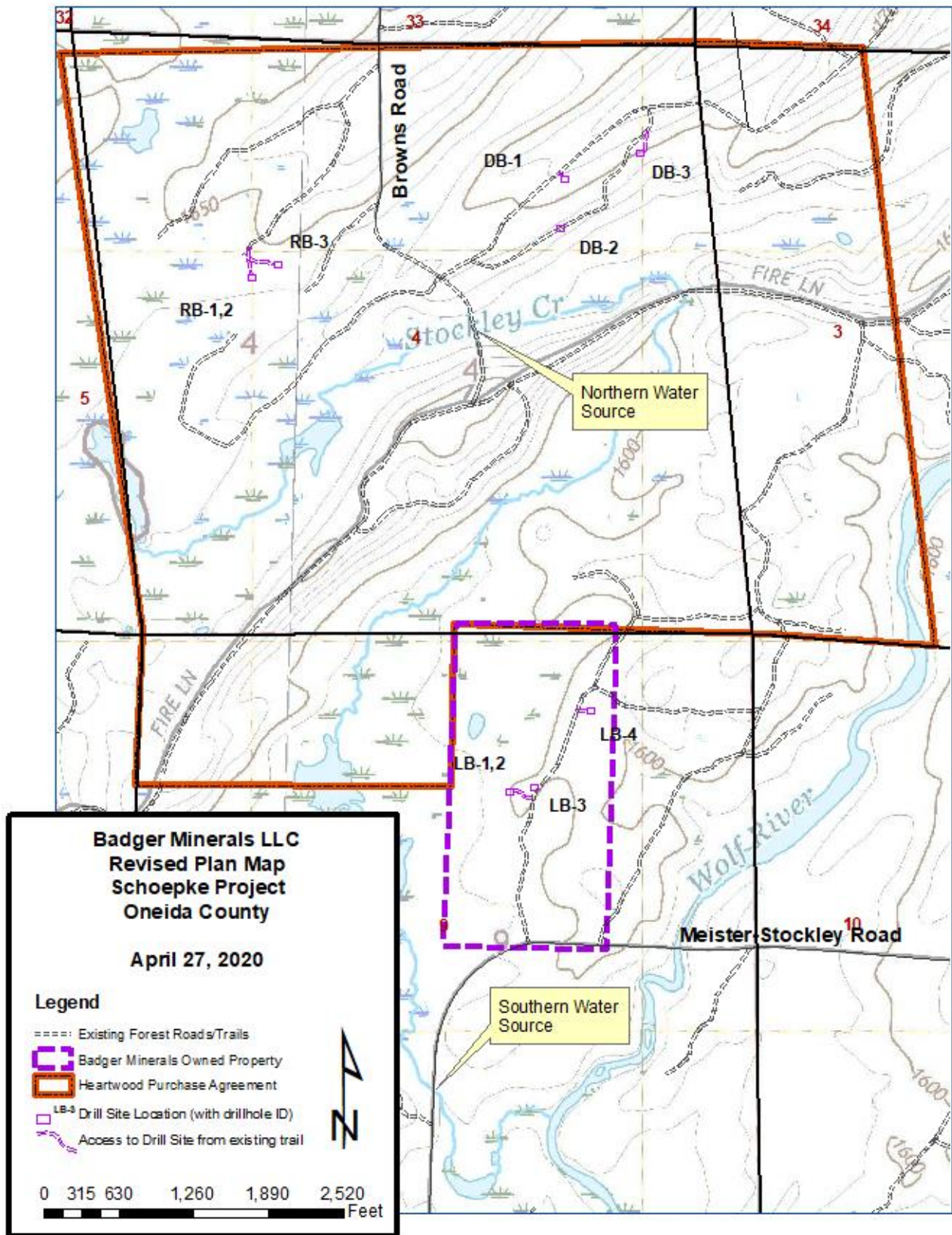


Figure 2 – Schematic Drawing of Typical Drill Site

